PITTIER[18] has published his fifth contribution dealing with new or noteworthy plants from Colombia and Central America. Under various subtitles 15 new species are described, representing 12 genera, *Bombacopsis* (Bombacaceae) being a new genus. There is also a revision of *Brownea* and *Browneopsis* (Caesalpiniaceae), as represented in Panama, Colombia, and Venezuela.

TAKEDA[19] has described a new genus (*Dysmorphococcus*) of algae, which resembles externally *Trachelomonas*. The material was found in a small stagnant pond in Richmond Park, Surrey, England.

VAN ALDERWERELT VAN ROSENBURGH,[20] in his seventh paper on new or interesting Malayan ferns, has published as new species or with new names 42 species of ferns, representing 21 genera, and also 3 new club mosses.—J. M. C.

Temperature and growth rate.—LEITCH,[21] working in the plant physiology laboratory of the University of Copenhagen, has done an excellent piece of work upon the effect of temperature on the rate of growth of the main root of *Pisum sativum*. Short experimental periods were used to avoid errors due to changing rate in the course of the grand period of growth. The period of maximum growth rate (root 5–10 mm. long) was also chosen. It was important in determining methods of experimentation that diffuse light or change of temperature, as such, does not modify the rate of growth of this organ. The temperature coefficient, Q_{10}, is as follows for temperatures between 0° C. and 28° C.

Range of temperature	Temperature coefficient	Range of temperature	Temperature coefficient
0–10° C. . . .	8.25	12–22° C. . . .	2.67
2–12°.	6.28	14–24°.	2.44
4–14°	4.58	. . . .	. . . .
6–16°.	3.72	16–26°.	2.31
8–18°.	3.24	18–28°.	2.22
10–20°.	2.88		

The temperature coefficient is typically VAN'T HOFF's only between 10° and 29° C., while below 10° C. the coefficient exceeds the VAN'T HOFF value of 2 to 3. This means little regarding the nature of the growth process, for the coefficient often greatly exceeds 3 in monomolecular reactions *in vitro*. In

[18] PITTIER, HENRY, New or noteworthy plants from Colombia and Central America. V. Contr. U.S. Nat. Herb. **18**:143–171. *pls. 57–80. figs. 10.* 1916.

[19] TAKEDA, H., *Dysmorphococcus variabilis*, gen. et sp. nov. Ann. Botany **30**:151–156. *figs. 15.* 1916.

[20] VAN ALDERWERELT VAN ROSENBURGH, C. R. W. K., New or interesting Malayan ferns. VII. Bull. Jard. Bot. Buitenzorg **20**:1–28. *pl. 4.* 1915.

[21] LEITCH, I., Some experiments on the influence of temperature on the rate of growth in *Pisum sativum*. Ann. Botany **30**:25–46. *figs. 10. pl. 1.* 1916.

growth, however, as is frequently true in chemical and physical processes, the coefficient falls as the temperature rises above 0° C.

At temperatures above 29° C. the initial rate is not maintained, but fluctuates or falls as time elapses, the well known *time factor* of BLACKMAN. At 30° and 35° C. the initial fall in rate is followed by a rise, which in turn is followed by a continuous fall, while at 40° C. the fall in growth rate is continuous with the elapse of time. This is comparable to the respiratory intensities at higher temperatures as determined by KUIJPER.[22]

The growth minimum for the organ studied is −2° C. and the maximum 44°5 C. In lieu of the errors involved in the old conception of optima, as shown by BLACKMAN and confirmed by many others, LEITCH proposes a new definition for *optimum temperature* in relation to any process in the organism, namely, *the highest temperature at which no time factor enters.* For the organ studied the point is between 28° and 30° C. A fourth cardinal point is defined, namely, *maximum-rate temperature*, as *the temperature at which the process attains its highest intensity*, which is 30°3 C. in this organ.

It is to be regretted that the author did not have an opportunity to examine the excellent work of LEHENBAUER (thesis, Illinois, 1914), who had, in large part, obtained similar results and arrived at similar conclusions.—WM. CROCKER.

Subalpine flora.—In continuing a series of phytogeographical papers, the first of which was recently reviewed in this journal,[23] RYDBERG[24] has discussed the forests and grasslands of the zones immediately below the alpine. He distinguishes two principal areas in the Rockies separated by a break in the range occurring in Wyoming about where the Union Pacific Railroad crosses. This break divides the portion of the region under discussion into the northern and the southern Rockies. The northern Rockies extend from the Yukon southward, and are made to include the Sawtooth Mountains of Idaho, the Tetons and the Big Horns of Wyoming, and the Cypress Hills of Alberta. They are further extended to include the Black Hills and smaller chains in their neighborhood. Over this area RYDBERG says the flora is practically homogeneous, and includes among other trees not found in the southern part *Larix occidentalis, Abies grandis, Tsuga heterophylla, T. mertensiana, Thuja plicata, Taxus brevifolia*, and several species of *Betula, Salix*, and *Populus*. In a further analysis of the flora, species exclusively southern and those common throughout the range are noted. Notes are also made of habits of growth and peculiarities of distribution of the more important trees and of the variation of altitudinal range of the zones.

---

[22] BOT. GAZ. 50:233–234. 1910. [23] BOT. GAZ. 59:64–65. 1915.

[24] RYDBERG, P. A., Phytogeographical notes on the Rocky Mountain region. IV. Forests of the subalpine and montane zones; V. Grasslands of the subalpine and montane zones. Bull. Torr. Bot. Club 42:11–25, 629–642. 1915.